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Final Comments of the Natural Resources Defense Council
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I. Resource Adequacy Standards

A. How should resource adequacy be defined and how does resource adequacy compare with or contrast with resiliency and reliability?

[Examples of issues under this question include: Does resource adequacy ensure reliability? What does "capacity shortage" mean? How does the resource mix/resource diversity/generator operating characteristics/generator attributes/fuel characteristics/fuel types/fuel sources etc. relate to resource adequacy?] Resource adequacy is the availability of generating and demand side resources that can be used to serve load at all times, including at peak, taking into account the possibility of forced outages for some of a system's generation fleet.

Resource adequacy should not be conflated with either resilience or reliability. Reliability is a system's ability to serve load under *typical* circumstances,[1] which includes expected disruptions to the system such as loss of generation or transmission. The more than 100 reliability standards of the North American Electric Reliability Corporation (NERC) primarily address system reliability. Relatedly, ancillary services such as regulation and frequency control, which are used to match generation on a moment-by-moment basis to maintain electrical frequency and system-wide stability, support system reliability. In contrast, a system's resilience is its ability to withstand and reduce the magnitude of disruptive events such as extreme weather or cyberattacks, and it includes the ability to anticipate, absorb, and recover from such events. [2]

To meet resource adequacy requirements, traditional generators like coal and nuclear plants, provide available capacity and energy during peak hours and during emergencies, but other technologies also can provide capacity and energy. For instance, a diverse portfolio of resources including gas plants, energy efficiency, demand response, solar, wind and can meet resource adequacy needs.

In addition, a thorough review of the future of Zone 4 resource adequacy necessitates an in-depth consideration of both public policy and marketplace directions to determine the most efficient and cost-effective generation mix that will maintain resource adequacy in Southern Illinois. For instance, the Future Energy Jobs Act (FEJA) and the most recent Illinois Power Agency (IPA) renewable procurement plan will significantly increase wind and solar capacity in Illinois[3]. Also, customers are increasingly demanding clean energy, as many businesses now value clean energy sources as both competitive with other energy sources and as a hedge against uncertain fuel and wholesale electricity prices. It also can be a selling point for their commercial image.[4] And if Illinois wants to retain or attract commercial activity, it would need to ensure an adequate amount of clean energy supply to meet these preferences. Thus, given the seemingly inevitable growth in renewable energy capacity in Zone 4, any resource adequacy discussion must be held with an eye towards the near and long-term generating capacity landscape. Subsidizing uneconomic Dynegy coal plants at the expense of competitive, cleaner resources, would produce a capacity mix of both variable generation -i.e. wind and solar- and large, inflexible fossil plants. This is increasingly shown to cause challenges,[5] as multiple studies are concluding that resource

[1] Citizens Utility Board ("CUB"), Pre-Workshop Comments to the ICC
[2] FERC, Grid Reliability and Resilience Pricing, at ¶ 23 (Docket RM18-1, Jan. 8, 2018).
[3] FEJA is expected to drive 3 GW of solar and 1.3 GW of wind in Illinois – enough wind and solar to power 1 million homes. The IPA plan mandates LSEs in Illinois to purchase the equivalent of 360 MW of *new wind* and 560 MW of *new solar each year* through 2030.
[4] In 2015 alone, more than 3,200 MW of voluntary renewable energy power purchase agreements were signed by commercial and industrial electricity customers.
[5] Studies show that this mix of variable and inflexible capacity can extend resource adequacy concerns from hours of peak demand to periods when the ramping capability of the combined mix is not enough to reliably meet load. The Brattle Report "Advancing past baseload to a

adequacy challenges arise when a growing amount of variable generation is integrated with large baseload generators that cannot quickly or economically adjust their generation in response to system needs[6].Operational flexibility- which could be provided by resources such as demand response, storage and fast-ramping gas plants- is becoming an increasingly important reliability and resource adequacy service, and artificially keeping a set of inefficient and inflexible coal plants online undercuts the system's ability to cultivate flexibility.[7].

To sum up, a crucial feature of ensuring near and long-term resource adequacy in Zone 4 lies in considering the anticipated changes in the capacity mix and positioning Southern Illinois in the most optimal way to reliably meet demand efficiently and cost-effectively. The Dynegy proposal completely overlooks the future and locks Southern Illinois in an increasingly antiquated system that is bound to face reliability challenges in the short and long-term.

B. What entities currently address resource adequacy, how do they do so, and how sufficient are such current measures?

[Examples of issues under this question include: Does MISO's capacity construct ensure resource adequacy and, if so, how? What are ICC's reserve margin setting rights under MISO's Module E tariff? Does the Illinois Power Agency assure resource adequacy in Zone 4? Does MISO's system support resource designation process relate to or shed light on resource adequacy and, if so, how?]

Considering that Zone 4 has easily met its Planning Reserve Margin Requirement (PRMR) for the past 20 years, the measures in place to ensure resource adequacy are clearly enough and functional. Moreover, the 2017 OMS-MISO survey shows that there is sufficient capacity to meet Zone 4's PRMR through at least 2022. To quote Ameren Illinois – "[T]here are sufficient resources in the market today and sufficient resources are forecasted to be available in the market

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flexible grid", Available at http://files.brattle.com/system/publications/pdfs/000/005/456/original/advancing_past_baseload_to_a_flexible_grid.pdf?1498482432

[6] The Brattle Group "Advancing past baseload to a flexible grid", Available at http://files.brattle.com/system/publications/pdfs/000/005/456/original/advancing_past_baseload_to_a_flexible_grid.pdf?1498482432

[7] For example, Astrape Consulting has analyzed these emerging resource adequacy needs in two very different systems – the California wholesale market and the single-utility system operated by PNM Resources in New Mexico- and reached the same conclusion that increasing the flexibility of a system maintains resource adequacy more easily and cost-effectively, and improves system reliability. Astrape, Flexibility Metrics and Standards Project—a California Energy Systems for the 21st Century (CES-21) Project, January 6, 2016, available at http://www.astrape.com/?ddownload=6826; Astrape, PNM Preliminary Reliability Analysis, April 18, 2017, available at https://www.pnm.com/documents/396023/3306887/04182017-irp-mtg-reliability/66b6bdc0-d9d4- 4f72-b1dc-076d8c5c74c2

in the next 3-5 years."[8]

Thus, any initiative -including SB2250/HB4141- attempting to overhaul a functioning market under the guise of a supposed resource adequacy threat is flawed and targets a problem that does not exist.

MISO's system support resource (SSR) designation process does not relate to resource adequacy. SSR contracts are employed to meet grid reliability needs, not reserve margin requirements, and MISO already safeguards against the retirement of must-run resources under its existing SSR policy.[9] If a planned plant closure triggers a reliability issue such as a voltage drop or reactive power deficit, an SSR might be necessary to keep the plant on line while MISO's transmission owner members construct or upgrade transmission lines or make other improvements to solve the issue. However, SSRs are not intended to address resource adequacy just as the Planning Resource Auction (PRA) does not address system reliability. MISO instead relies on market forces and state action to make up any structural resource adequacy deficit. Thus, Dynegy's projection that MISO would be forced to enter into SSR contracts with the company to keep one or more of the retiring units in operation for resource adequacy purposes is untenable. The ICC should separate out and remove the reliability pieces from the discussion and focus solely on resource adequacy.

II. Resource Adequacy Measurement

A. How much generation is currently available to meet Zone 4 resource adequacy requirements?

[Examples of issues under this question should include: How much generation is currently available and what are the market shares of such generation owners? What types of generation resources are available and in what proportions? What are the fuel sources of current generation and in what proportions? What are the ages and current conditions of current generation? What are the capacity factors of current plants? How do name plate and unforced capacity impact the ability of generation resources to meet Zone 4 resource adequacy needs? What generation is located within Illinois and what generation is outside Illinois and how does location impact availability or dependability?]

Please refer to the Excel attachment and map below (Figure 1) for a full list of generating resources currently available in both Zone 4 and the PJM ComEd zone. There are more than 16,500 MW of generating resources currently operating in Zone 4, including 142 MW of wind and hydro resources under construction set to come online in 2018, 475 MW of wind projects with regulatory approvals set to come online by 2019, and 2,147 MW of wind and 2,153 MW of solar resources in the queue set to come online by 2020 (as of October 2017).

[8] Ameren Illinois, Pre-Workshop Comments on Energy Resource Adequacy 1 (Nov. 30, 2017)
[9] CUB post-workshop comments page 6

In addition to generating resources in Zone 4, Southern Illinois can also rely on resources located in neighboring MISO zones to meet load and resource adequacy requirements. As discussed in more detail in Section III.B, Zone 4 can import up to nearly 6,300 MW,[10] which is the second highest import capability across the MISO footprint, without any identified constraints, from neighboring MISO zones. Moreover, Zone 4 is well connected to PJM, as discussed in more detail in Section III.B below, and LSEs have the option of importing firm capacity from PJM, namely from the ComEd zone, to meet both load and resource adequacy needs (we discuss in more detail how PJM imports could help meet resource adequacy in Section III.B).

As long as an LSE in Zone 4 meets its Local Clearing Requirement (LCR) (more detail on this in SectionI III.B), any resource outside of Zone 4 that it either contracts with for capacity or purchases in the Planning Resource Auction (PRA) is under contractual obligation to both be available and dependable when called on to meet peak demand. Thus, the fact that a generating resource is located outside of Zone 4 does not and should not impact neither its availability not its dependability.

[10] This is MISO's proposed 2018/19 CIL for Zone 4

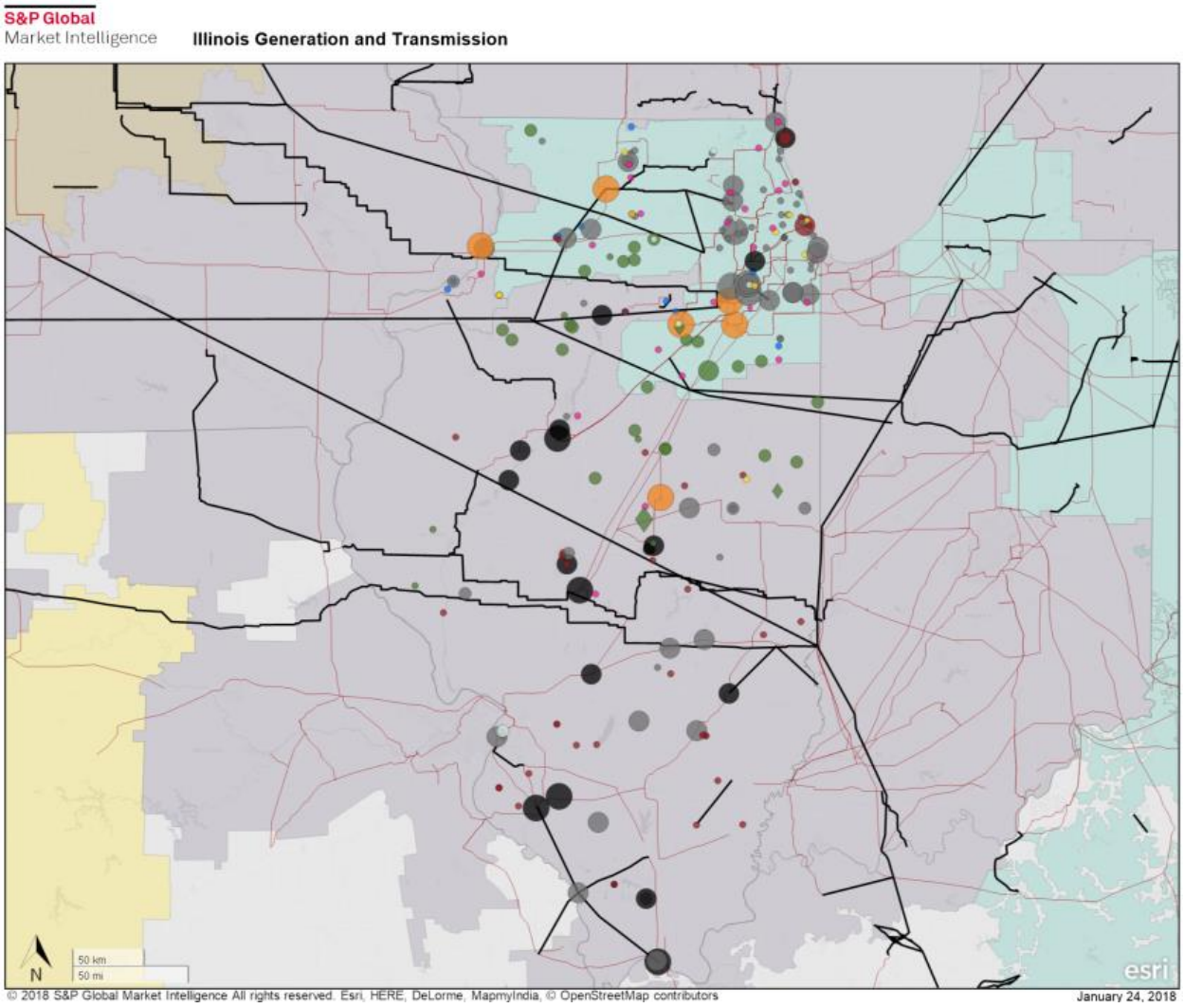

Figure 1: Illinois Generation and Transmission

The thick black lines show planned transmission projects, and the thinner dark red lines show existing transmission. The circles represent generating plants and are color coded to reflect the different technology types. Black: coal; Grey: gas; Orange: nuclear; Green: wind; Yellow: solar; Blue: hydro; Pink: biomass; Brown: oil
Source: S&P Global – Market Intelligence

B. What generation resources formerly meeting Zone 4 resource adequacy requirements have recently been lost due to retirement, derating, declining capacity factor, or otherwise?

This information is proprietary and not available to the public. Load Serving Entities (LSEs) confidentially disclose their planning resources needed to meet their resource adequacy requirements to MISO. In addition, given that the MISO planning residual auction ("PRA") results and bid details are also confidential, the generation resources that have historically met or

currently meet Zone 4 resource adequacy needs could not be determined relying on publicly available data.

It is important to note that a discussion of the loss of resources formerly meeting Zone 4 resource adequacy needs is to a large extent moot. Despite any recent plant retirements, Zone 4 resource adequacy is secure through at least 2022 (as discussed in Section I.B). In addition, Zone 4 and the region are expected to have a large increase in installed capacity in the coming years as discussed throughout these comments, while electricity demand is expected to flatline or even decrease owing to the impressive energy efficiency requirements for LSEs under FEJA. Both of these factors give reason to expected that Zone 4 resource adequacy will continue to be met beyond 2022. Thus, an examination of future trends is more relevant and valuable than looking in the rearview mirror for the purposes of a discussion on near and long-term Zone 4 resource adequacy.

C. What current generation resources available to meet Zone 4 resource adequacy requirements are at risk of becoming unavailable going forward and what are the implications of the loss of such resources?

[Examples of issues under this question should include: Are there generating plants in Zone 4 that currently are "financially at risk" of shutting down? What are other reasons that existing generation may shut down? Is there data to support such an assessment? Is scenario modeling a reasonable approach for resource adequacy assessment? How does the loss of generation resources impact the capacity factors of remaining plants? Are any current federal or state energy policies adding risk for existing Zone 4 generator owners? How should the expected timing of retirements be considered?]

Dynegy claims that "generating units in Dynegy's Downstate fleet totaling approximately 3,000 MW (out of a total of approximately 5,500 MW) are at risk of shutdown because in the current market conditions, the revenues they receive are less than their fuel and operating costs."[11] The 625 MW Baldwin Energy Complex Unit 1, owned by Dynegy, is also slated for retirement this year.[12] Dynegy also claims that retiring most of its plants in the near-term would result in resource adequacy issues for Zone 4. However, Dynegy does not substantiate its claim with any robust modeling. Rather, the company grounds its reasoning in a crude number-crunching exercise that overlooks and assumes nil any potential grid response to replace the plants' output and ensure that demand continues to be reliably met. This is *not* how the power sector works. Fully understanding the impact of plant retirements on the grid requires in-depth power sector modeling that examines feasible alternatives to the plants along with their associated costs.

D. What are the prospects for new generation resources becoming available to meet Zone 4 resource adequacy going forward?

[11] Dynegy, post-workshop comments to the ICC, page 3.

[12] It is unclear if Dynegy counts this unit towards the 3,000 MW that it claims to be at risk of retiring.

[Examples of issues under this question include: How should resources within the current MISO interconnection queue be counted for purposes of assessing their value in meeting future Zone 4 resources adequacy needs? How will new renewables meet Zone 4 resource adequacy needs?]

Both MISO and Zone 4 are expected to experience a significant influx of new capacity by 2021, mainly wind and solar energy. The MISO interconnection queue should be valued as an indicator of the potential generating resources that could come online in the near-term, as well as their geographic location. The fact that a number of projects in the queue eventually drop out should not detract from its ability to inform planning decisions. MISO itself relies on it to inform a number of its studies.[13]

Zone 4 has more renewable energy capacity in the MISO queue than any other zone. More than 4,300 MW of renewable capacity- 2,147 MW of wind and 2,153 MW of solar- are in the definitive planning phase ("DPP") of the queue for Zone 4 as of October 2017. Even under MISO's conservative assumption that only 35 percent of these projects will eventually come online,[14] this is still at least 751 MW and 754 MW of new wind and solar respectively poised to be in operation by 2020. Adding the wind resources under construction or with secure regulatory approvals brings the total to 1,360 MW and 754 MW of new wind and solar, respectively, which should be expected to be operational by 2020 in Zone 4[15]. Applying the current MISO-adopted capacity credits for wind and solar of 15.6 percent and 50 percent, respectively, Zone 4 should expect at least 590 MW of new wind and solar capacity to be operational by 2020, on a UCAP basis. This alone makes up for roughly 22 percent of the Dynegy at-risk capacity of 3,000 MW.[16]Therefore, the bare minimum of capacity buildout by 2020 in Zone 4 is enough to make up for nearly a quarter of the Dynegy at-risk capacity.

[13] Including the OMS-Survey

[14] Note that MISO is revising the 35 percent figure to better capture that the farther along projects are in the DPP phase, the more chance they have of making it through to commercial operation

[15] As discussed in Section II.A, there are 132 MW of wind resources under construction, set to come online in 2018, and 475 MW of wind projects which have received regulatory approvals but haven't begun construction, with online dates of 2018 and 2019 in Zone 4. For simplification purposes, we are ignoring an additional 11 MW of solar and hydro resources also under construction in Zone 4 and set to come online in 2018. This excludes more than 730 MW of projects (mainly wind) either under construction or with secure regulatory approvals in the ComEd zone although at least some of those resources should reasonably be considered readily available to meet load and reliability needs in Zone 4.

[16] The 22 percent is on a UCAP basis. It reflects the load carrying capability of the Dynegy plants of 90 percent – 0.9x3,000= 2,700 MW.

Further, MISO Zone 4 can import from sources outside of its borders and is uniquely situated to do so. LSEs in Southern Illinois can also tap into generating resources in other MISO zones to meet their PRMRs. This is reflected in the capacity import limit (CIL) discussed in more detail in Section III.B. Across the MISO footprint, roughly 45 GW of renewables- 15.3 GW of solar and 29 GW of wind are in the DPP of the MISO queue set to come online in the next three years. Moreover, 11 GW of natural gas plants are planned to be operational by 2021. Adopting MISO's conservative assumption that only 35 percent of these projects will make it to commercial operation, at least 5.4 GW of solar projects, 10 GW of wind projects and 3.9 GW of gas plants are expected to be operational across all of MISO zones by 2021. With the second highest electricity import capability across the MISO footprint, Zone 4 is uniquely capable of taking advantage of these new low- cost generation resources to meet resource adequacy needs going forward.

During the workshops, critics have argued that wind and solar resources would not be adequate to replace the output from the Dynegy plants as they tend to be unavailable during peak demand times. First of all, wind and solar both receive a capacity credit, however modest it is for wind, demonstrating their value. This means that they *can* be available at peak times. In addition, solar resources receive a 50 percent capacity credit, and current technological advancements are expected to drive their capacity value to 60 percent or greater.[17] As for wind, MISO is continuing work on seasonal capacity constructs, which could boost the value of wind resources in meeting winter peak demand. Second, the critics' argument ignores the recent major advancements in system planning and wholesale market management practices that are enabling grid operators to reliably integrate large amounts of solar and wind into the grid to meet load and resource adequacy requirements.[18] In fact, given the large recent growth in renewable capacity and anticipated continued growth,[19] grid operators are increasingly valuing flexible resources like demand response, storage and fast-ramping gas-fired resources to accompany the variable generation of wind and solar. For example, MISO introduced a ramping product, which compensates resources (including renewable resources) for their ramping capability.[20] And Southern Illinois is well positioned to accommodate the anticipated growth in renewable capacity while meeting reliability and resource adequacy requirements. For example, in its 2017 Long-term reliability assessment (LTRA), NERC states that both Zone 4 and Zone 7 (covering most of the Michigan lower peninsula) will have a significant increase in demand response and

[17] Single-axis panels can get a capacity credit of 60 percent and more

[18] The Brattle Group's "Advancing past baseload to a flexible grid" report discusses in detail the progress that grid operators have made to reliably integrate wind and solar resources while providing important benefits to customers. The report is available at http://files.brattle.com/system/publications/pdfs/000/005/456/original/advancing_past_baseload_to_a_flexible_grid.pdf?1498482432

[19] Due to technology cost reductions, state policies favoring renewable investments and increased customer demand for cleaner energy

[20] https://www.misoenergy.org/Library/Repository/Communication%20Material/Strategic%20Initiatives /Ramp%20Capability%20Product%20Cost%20Benefit%20Analysis.pdf

distributed resources through 2027, based on new registrations by aggregators in MISO's Module E Capacity Tracking Tool.[21] This anticipated growth in demand-side resources, particularly demand response, will help accommodate the increased renewable generation. In addition, Zone 4 has more than 5 GW of natural gas-fired combined-cycle and combustion turbine units.[22] The combustion turbine units could be dispatched in conjunction with renewable generation to help accommodate peak demand, while the combined cycle plants could be ramped up and down in a flexible manner to accommodate the variable output of wind and solar resources.[23]

To sum up, claiming that renewable resources should be dismissed for their lack of output during peak times is based on what is quickly becoming antiquated reasoning that largely ignores major advancements in technology and grid management across the country.

E. What non-generation resources are and will be available to meet resource adequacy and how do such resources impact resource adequacy?

[Examples of issues under this question include: How do distributed generation resources, demand response resources, energy efficiency resources, and storage resources meet Zone 4 adequacy requirements? How will P.A. 99-0906 impact resource adequacy in Zone 4?]

Demand response, distributed generation, energy efficiency and storage all contribute to resource adequacy. It is worth noting that most of these newer technologies – including wind and solar resources, as well as demand response and storage, are able to respond to system emergencies more quickly than the fleet of inflexible coal and nuclear plants, particularly when the response requires the units to start up.

As mentioned in Section II.D, Zone 4 is expected to have a significant increase in demand response through 2027. Demand response and storage are efficient and operationally-flexible resources which can dynamically adjust their operating levels in response to changing system conditions, such as variations in demand, variations in renewable generation, extreme weather conditions, and system emergencies. In other words, these resources are both very valuable for resource adequacy and cheaper than other generation resources.

Similarly, the large increase in distributed solar resources and energy efficiency investments expected in both Northern and Southern Illinois will enhance LSEs' ability to meet their resource adequacy requirements. For instance, under FEJA, LSEs are required to significantly expand

[21] NERC, 2017 Long-term reliability assessment, p. 42

[22] The ComEd zone also has a large number of gas plants – more than 13 GW. At least *some* of those plants can be counted on to supply energy to Zone 4 and help integrate wind and solar resources.

[23] The bulk of the combined cycle plants in Southern and Northern Illinois had capacity factors lower than 65 percent (a lot of these plants had capacity factors much lower than 65 percent) in 2015 and 2016. This means that there is room for these plants to ramp up and help accommodate the anticipated increase in wind and solar growth.

their energy efficiency programs, and achieve a 21.5 percent and 16 percent reduction in energy use by 2030, for Commonwealth Edison (ComEd) and Ameren Illinois Company (Ameren), respectively. This will not only have the effect of noticeably reducing the LSEs PRMRs, but also free up a lot of the capacity currently being used to meet load and direct it towards meeting resource adequacy needs. Similarly, distributed solar reduces customer demand, and thus puts downward pressure on PRMRs, enhancing LSEs ability to achieve resource adequacy.

This trend is not exclusive to Zone 4, as MISO forecasts an increase in demand-side resources across its footprint, and is doubling down on its efforts to account for these resources in its transmission planning studies- namely MTEP19.[24]

In sum, demand-side resources like distributed generation, demand response, energy efficiency resources, and storage not only help reliably and cost-effectively integrate growing amounts of renewable generation on the grid, but also enhance the LSEs' ability to achieve resource adequacy and will be increasingly available in the near future to help address resource adequacy concerns.

F. How well do existing programs and initiatives predict future resource adequacy?

[Examples of issues under this question include: How well does the OMS MISO survey address resource adequacy prediction? How well does NERC's 2017 Long Term Reliability Assessment address resource adequacy measurement in Zone 4?]

The OMS-MISO Survey is a useful tool for providing a regional view of LSE resource plans, as well as transparency on how the MISO region and its zones will fare in terms of meeting resource adequacy and reliability requirements in the near-term. Although the survey relied on flawed assumptions in the past (namely overly pessimistic assumptions regarding coal plant retirements and load growth), MISO implemented some important changes to improve the survey and better capture supply and demand across the footprint. While the survey is not a prediction of the near-term state of resource adequacy, it is still an informed and robust indication of how secure resource adequacy is and will be based on anticipated retirements and new resource additions. The latest 2017 MISO-OMS Survey results showing that both MISO and Zone 4 will remain long on capacity through at least 2022 provides a reasonable and sound basis to take the time to conduct further in-depth modeling to evaluate how Zone 4 would fare if some or all Dynegy coal plants were to close, instead of making an uniformed, hasty and likely costly move to overhaul the functioning capacity construct of Southern Illinois. It is worth noting that Dynegy's criticism of the Survey in its pre-workshop comments fails to predict future resource adequacy with any authority because it is too simplistic and does not capture the complexity of the power sector nor does it evaluate Southern Illinois' ability to make up for whatever gap is produced from lost generation resources. It merely subtracts some of its at-risk capacity from the

[24] As we mentioned in our previous set of comments, MISO has contracted with industry and Department of Energy National Lab experts to improve forecasts and siting of distributed generation resources in its MTEP19.

Survey totals in a crude manner, and makes the bold inference that Southern Illinois will be in trouble without its coal plants.

III. Market Design Impact on Resource Adequacy

A. What alternative opportunities are available to resources that could otherwise be used to meet resource adequacy in Zone 4 and how do these opportunities impact Zone 4 resource adequacy?

[Examples of issues under this question include: What opportunities do resources that could otherwise be used to meet resource adequacy in Zone 4 have to pseudo-tie or sell into non-Zone 4 capacity markets?]

B. How does the transmission system impact resource adequacy?

[Examples of issues under this question include: How are capacity import limits and local clearing requirements tied to the transmission system? What is the impact of the MISO south-to-north transfer limit? What is the impact of MVP lines? How does the size of external capacity resources potentially available to meet Zone 4 resource adequacy needs compare to the amount of transmission available to import such resources into Zone 4? What is the Zone 4 resource adequacy value of generation resources within the ComEd Zone of PJM relative to the Zone 4 resource adequacy value of resources in MISO zones outside Zone 4? What is the impact of new transmission designed to transport intra-state renewables?]

The CIL of a zone reflects the limit on capacity that can be imported from an adjacent MISO zone or zones. However, it is worth stressing that it is not the import limit of the transmission system into a zone, nor does it cover the capacity to import power via a firm purchase agreement from another Regional Transmission Operator (RTO). The local clearing requirement (LCR) is the amount of capacity that needs to be located in the zone itself to achieve resource adequacy. The larger the CIL of a zone, the lower the LCR, as LSEs have the ability to tap into resources in adjacent zones and rely less on resources located in the zone to meet resource adequacy.

MISO Zone 4 is uniquely capable of taking advantage of low cost resources outside of the Zone 4, as it has the second highest CIL across the MISO footprint and a relatively low LCR. This means that LSEs in Southern Illinois have a bigger opportunity than nearly any other MISO region to take advantage of low-cost resources outside of Zone 4 to meet their PRMR. At the same time, the CIL for Zone 4 has been steadily increasing between planning years 2014/15 and 2017/18, and nearly doubled between those same planning years. And, the proposed 2018/2019 CIL is even higher. The trend in CIL, coupled with MISO's expected regional capacity surpluses through at least 2022 (discussed in more detail in Section II.F) highlights the opportunity for Southern Illinois to increasingly take advantage of cost-effective capacity located in other MISO zones to meet its PRMR.

New, proposed multi-value projects (MVPs) building transmission lines further bolster MISO Zone 4 import capability. Illinois is projected to experience a significant increase in its transfer capability with other MISO states in the near-term, as the five multi-value transmission projects that will be crossing through Illinois are expected to be completed by 2019 (one line is already complete). In addition, another MVP - the Mark Twain line- recently got approved by the Missouri Public Service Commission. This line nearly dips in Southern Illinois and is expected to drive nearly 1,300 MW of new wind capacity in Northeast Missouri, which Zone 4 could tap into. These new transmission lines will give LSEs in Zone 4 increased access to low-cost wind and other surplus generation located in other MISO zones, and thus enhance their ability of achieving resource adequacy while relying less on capacity located in the zone itself.

Moreover, Zone 4 is well connected to PJM (Figure 2 below). And considering that PJM is projected to have significant surplus capacity through at least 2027,[25] and that the ComEd zone is expected to have no to negative load growth due to impressive efficiency mandates under FEJA, LSEs in Zone 4 can contract with generators located in PJM to meet their demand and lower their PRMR. The PRMR is expressed in the following equation, per Asset Owner per Local Resource Zone[26]:

$$PRMR_{LRZ} = \sum_{LBA} [(CPDf \ - FRP \ + FRS \ ) \times (1 + TL\% \ ) \times (1 + PRM_{RTO})]$$

Where:

$PRMR_{LRZ}$ = Planning Reserve Margin Requirement per LRZ

CPDf = Coincident Peak Demand forecast per LBA

FRP = Full Responsibility Purchase per LBA

FRS = Full Responsibility Sale per LBA

TL% = Transmission Loss Percentage of LBA

PRM_{RTO} = Planning Reserve Margin in Unforced Capacity set by LOLE Studies

Firm capacity purchases from PJM qualify as Full Responsibility Purchases in this equation and are subtracted out of the utility's Coincident Peak Demand requirement. Therefore, such purchases would reduce LSEs PRMR in Zone 4[27].

[25] NERC calculates as much as a 60% prospective reserve margin by 2022. Even in the most conservative "anticipated" analysis, PJM should see at least a 27% reserve margin every year 2018-2027. NERC, 2017 Long-term Reliability Assessment, page 124

[26] MISO Resource Adequacy Business Practice Manual, page 11

[27] It's worth noting that LSEs in Zone 4 would not incur additional charges for using the PJM transmission system above the MISO transmission tariff, due to the license plate transmission rate tariffs established between MISO and PJM.

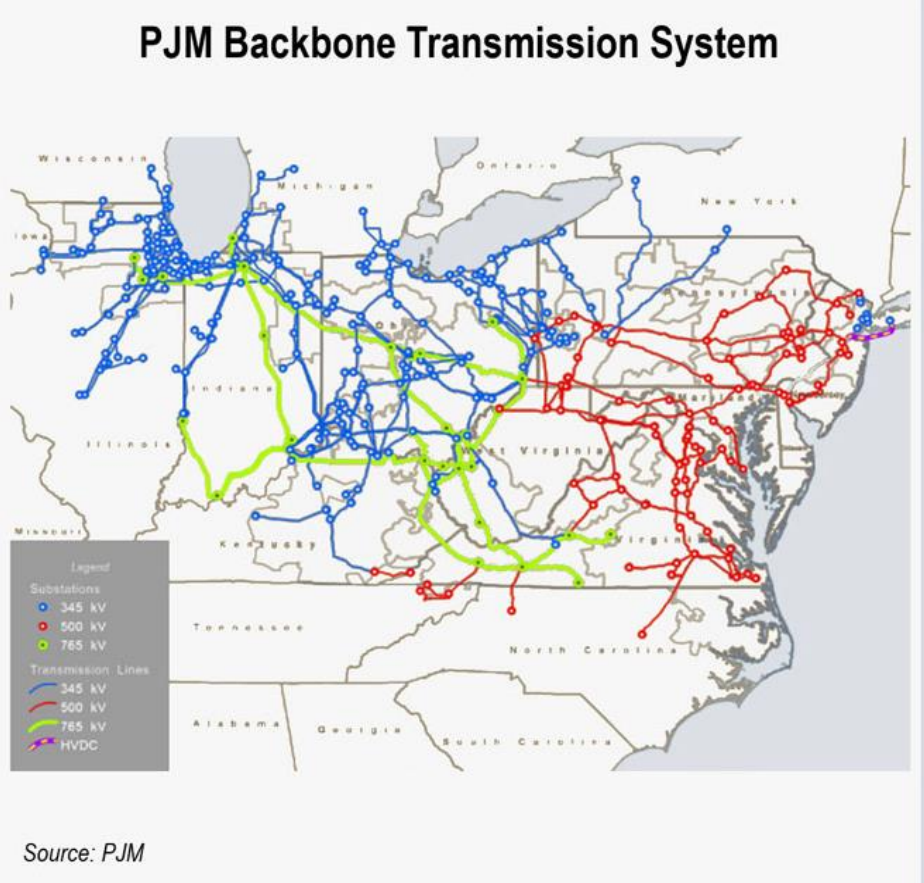

Figure 2: PJM Backbone Transmission System
Source: PJM

C. How do facilities owned by municipals and cooperatives affect resource adequacy?

Municipal utilities and electric cooperatives have an obligation to serve their communities and therefore have secure generation assets and procure energy and capacity through firm bilateral contracts. This ensures that a large part of the resource adequacy requirements in Zone 4 – served by a large number of municipal and coop utilities - will be met through self-supply no matter what changes occur in the market.

D. How does bilateral contracting, self-supply, fixed resource adequacy planning affect resource adequacy?

E. How do so-called out-of-market revenues (revenues separate and apart from those obtained in wholesale markets (e.g., Zero Emission payments or renewable energy credits) impact resource adequacy?

IV. Scope

A. Please provide commentary on any relevant substantive or process issue you believe has not been adequately captured in the Sections above.

[Examples of issues under this question include: Should any of the following topics have received time and attention, or more time and attention, in the workshops than they received: reliability, resilience, price stability, price level, consumer cost, sustainability, security, environmental/public health impact, potential policy initiative impact on rates, etc.? Should additional workshops or other processes be conducted and, if so, what topics should be examined? What actions that may be forthcoming (e.g., FERC actions, PJM or MISO tariff changes, corporate mergers) could impact resource adequacy or this Zone 4 assessment and how?]

Several important pieces of the discussion have been largely left out over the course of this process. Half of the Dynegy coal plants lack crucial emissions controls and are emitters of harmful pollutants like nitrogen oxides (NOx) and sulfur dioxide (SO2). These cause several respiratory illnesses and other severe health problems, which have quantifiable economic costs. Any discussion related to the value of the Dynegy plants requires a careful consideration of their public health impact on Illinoisans in terms of asthma attacks and other illnesses, along with their accompanied costs (missed work days, reduced productivity, healthcare payments)[28].

Moreover, a thorough evaluation of the economic benefits of ramping up renewable investments in Southern Illinois must be conducted. As we discussed at length in our pre-workshop comments, increasing wind and solar investments in Southern Illinois is an opportunity to vitalize the area, as clean energy access is quickly becoming an attraction for businesses looking to locate their facilities (refer to our pre-workshop comments for a list of neighboring states including Michigan, Missouri, Nebraska and Iowa that have significantly ramped up their clean energy investments to attract commercial activity, and are expected to reap large economic benefits). And these businesses are also creating jobs and beefing up counties' tax bases. A thorough and fair discussion should also evaluate the benefits of wind and solar expansion to counties in the form of land lease payments to farmers and tax revenues.[29] For example, local schools are often among the largest wind farm beneficiaries. Wind projects substantially expand local tax bases, with schools reaping the rewards[30]. For example, researchers from Oklahoma State University found wind farms in the Sooner State will pay schools over $1 billion during their lifetimes. This means educators can buy new computers, build athletic fields and offer

[28] An NRDC analysis has estimated that between 2018 and 2030, the Future Energy Jobs Act would help cumulatively avoid 132,960 lost work days, 17,890 asthma attacks, 1,100 asthma-related emergency room visits, 780 hospital admissions, 1,650 heart attacks, and up to 2,800 premature deaths. Analysis available here: https://www.nrdc.org/sites/default/files/health-benefits-illinois-future-energy-jobs-act-report.pdf

[29] Every year, farmers and ranchers who host wind turbines are paid $245 million in lease payments. That income can make the difference between continuing a multi-generation tradition and having to sell off the family farm.

[30] https://www.awea.org/Issues/Content.aspx?ItemNumber=9806

college-level courses in places where they previously didn't have the resources to offer these opportunities.[31]

A thorough discussion should also touch on the elements of achieving a "just transition" for the Dynegy workers and the potential for creating economic opportunities that will help release the communities from their reliance on coal.

V. Potential Policy Options

A. What changes, if any, should be made to better enable measurement and assessment of what resources are available to meet Zone 4 resource adequacy requirements?

[Examples of issues under this question should include: Can, and if so how can, MISO's plant retirement process be changed to better enable measurement of resource adequacy? Can, and if so how can, the OMS MISO survey (both load and resources) be revised to better enable assessment of resource adequacy? Can, and if so how can, MISO's load forecasting methodology be revised to better enable assessment of resource adequacy? Is there a role for MISO, Ameren Illinois or the ICC in improving industry trade press reporting of forward market prices for capacity bilaterally traded in MISO Zone? Should MISO renew its search for a MISO-implemented approach such as its former competitive retail solution initiative to assist resource adequacy in Zone 4?]

B. What changes, if any, should be made to MISO's capacity construct including to the MISO planning resource auction to better ensure resource adequacy?

[Examples of issues under this question include: Should MISO move to a forward rather than prompt auction. Should MISO employ a sloped rather than vertical demand curve? What changes, if any, should MISO make to address participation of capacity supplied by facilities that recover their costs through regulated rates?]

MISO's market and planning rules significantly affect resource adequacy in Zone 4. For that reason, MISO should adopt market and planning rules that would strengthen resource adequacy in Zone 4. For example:

- **Implement a seasonal component to the resource adequacy construct.**

A seasonal component would accurately value and extract more capacity value from wind and solar energy, provide flexibility for uneconomic retiring generators, and mitigate seasonal resource adequacy challenges. For example, MISO's current resource adequacy construct does not fully credit the non-summer peak contributions of wind resources, which on average generate more energy during non-summer months. Implementing a seasonal component to MISO's

[31] http://www.aweablog.org/wind-offers-oklahoma-schools-lifeline-budget-cuts/

resource adequacy construct will provide more credit for seasonal resources and reduce over-procurement.

- **Reduce market barriers to entry for new, flexible energy technologies and improve their incorporation in MISO transmission planning and generator retirement processes.**

Changes in the fuel mix are creating new opportunities for flexible demand response and distributed energy resources that contribute to resource adequacy by providing capacity, energy, and fast-ramping capabilities. To facilitate integration of these resources into the grid, MISO should reduce the minimum eligibility level for participation in MISO's markets from 5 MW to 100 kilowatts (kW). MISO also should allow aggregation of distributed and demand resources across planning boundaries. Other markets, including PJM and ISO NE, do not have MISO's barriers; these markets have minimum participation limits of 100 kW and allow for aggregation of distributed resources. MISO's barriers have real consequences to resource adequacy. Without the ability to earn revenue in energy and ancillary services markets, many developers are unwilling to invest in distributed energy resources in MISO, blocking new technology development and preventing them from contributing to resource adequacy.

- **Develop or support interregional transmission projects capable of carrying large amounts of wind from the Great Plains to Illinois.**

Building off of its successful MVP initiative, MISO should keep evaluating transmission options enabling states to accelerate their transition to more low-cost renewables and support the completion the projects.

C. What changes, if any, should be made to MISO's energy or ancillary service constructs that would help maintain resource adequacy?

D. What actions should the Illinois Commerce Commission and/or the Illinois Power Agency take, if any, to address resource adequacy assuming no new legislative authority?

[Examples of issues under this question include: Should the IPA alter its strategy for hedging either energy or capacity Ameren's eligible retail customers?]

We recommend that the Illinois Commerce Commission take no action. Zone 4 resource adequacy is secure through at least 2022 and trends discussed in these comments give reason to expect that long-term resource adequacy will be secure as well. Any action to drastically overhaul the functioning Zone 4 capacity market should be grounded in in-depth, thorough modeling that examines the impact, if any, of the Dynegy plants retirements on resource adequacy and reliability, as well as an extensive stakeholder process with a timeframe long enough to evaluate this complex issue.

E. What actions should the Illinois General Assembly take, if any, to address Zone 4 resource adequacy?

[Examples of issues under this question include: Should the General Assembly pursue any of the legislative approaches addressed in the "Potential Policy Options" section of the November 1, 2017 ICC Staff White Paper. Should the General Assembly authorize the Illinois Commerce Commission to collect information for purposes of assessing resource adequacy from Illinois generation resources?]

As stated above, there is no need for action, and the General Assembly should not take any. Zone 4 resource adequacy is secure through at least 2022, and trends discussed in these comments give reason to expect that long-term resource adequacy will be secure as well. Any action to drastically overhaul the functioning Zone 4 capacity market should be grounded in in-depth, thorough modeling that examines the impact, if any, of the Dynegy plants retirements on resource adequacy and reliability and cost, as well as an extensive stakeholder process with a timeframe long enough to evaluate this complex issue.

F. Please describe any additional potential policy option(s) you would like to see considered.

G. Is it important for any selected policy option to be market-based? If so, why? If not, why not?

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